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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/654,203	09/03/2003	James A. Rakowski	RL-2000	5809

7590 09/18/2006

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EXAMINER

ALEXANDER, MICHAEL P

ART UNIT	PAPER NUMBER
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1742

DATE MAILED: 09/18/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/654,203	Applicant(s) RAKOWSKI, JAMES A.	
	Examiner Michael P. Alexander	Art Unit 1742	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 July 2006.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-98 is/are pending in the application.
- 4a) Of the above claim(s) 6,8,14,23,24 and 27-98 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5,7,9-13,15-22,25 and 26 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input checked="" type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. <u>Sept. 11, 2006</u> . |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>09/03/03, 7/15/05</u> . | 6) <input checked="" type="checkbox"/> Other: <u>IDS: 1/10/06, 5/22/06, 6/21/06</u> . |

DETAILED ACTION

Claim(s) 1-98 is/are pending.

Election/Restrictions

Claims 29-98^{are} withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 6 July 2006.

Claims 6, 8, 14, 23-24 and 27-28 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected species, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 6 July 2006.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

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Claims 1-5, 7, 9 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Aries (Effect of stabilizing heat treatment on characteristics of electrolytic alumina coating on ferritic stainless steel).

Regarding claim 1, Aries teaches (Table 1, section 2.1 – section 3.1) a method for making a ferritic stainless steel article having an oxidation resistant surface, the method comprising: providing a ferritic stainless steel comprising aluminum and 16 to 30 wt% Cr; and modifying at least one surface of the ferritic stainless steel so that, when subjected to an oxidizing atmosphere at high temperature, the modified surface develops chromium substituted magnetite iron oxide coexisting with a Fe_2O_3 type iron oxide substituted by chromium to varying degrees and an electrolytic alumina deposit. The Examiner asserts that the Fe_2O_3 type iron oxide substituted by chromium would be the hematite structure differing from Fe_2O_3 , which would inherently be electrically conductive (because hematite is inherently electrically conductive).

Still regarding claim 1, Aries does not specify the presence of at least one rare earth metal greater than 0.02 weight percent. However, Aries teaches (page 496) that the addition of rare earth elements strongly improves the adherence of the protective alumina scale on the stainless steel. Since the addition of rare earth elements would be a result effective variable as taught by Aries, it would have been obvious to one of ordinary skill in the art to modify the steel of Aries by adding the desired amount of rare earth elements in order to improve the adherence of the protective alumina scale on the stainless steel as a routine optimization as taught by Aries.

Regarding claim 2, the Examiner asserts that the Fe_2O_3 type iron oxide substituted by chromium would inherently have a_0 and c_0 differing from that of Fe_2O_3 , alpha Cr_2O_3 and alpha Al_2O_3 because the structure is different from that of Fe_2O_3 , alpha Cr_2O_3 and alpha Al_2O_3 .

Regarding claim 3, Aries teaches (section 2.1) heating at 800 degrees C, to form the alumina coating.

Regarding claim 4, Aries teaches (section 3.2.1) treatment times of 5 hours, 10 hours and 24 hours and that the treatment time does not affect the coating thickness. It would have been obvious to one of ordinary skill in the art to modify the method of Aries by using the steel for even longer lengths of time in order to use the steel in service because Aries teaches that the treatment time does not affect the coating thickness.

Regarding claim 5, Aries teaches (section 4) the formation of a Cr_2O_3 inner layer, which inherently has the claimed lattice parameters.

Regarding claim 7, Aries teaches (section 2.1) electrochemically modifying at least one surface.

Regarding claim 9, see the rejections of claims 4 and 5.

Regarding claim 11, Aries teaches (Table 1, section 2.1) a method for making a ferritic stainless steel article having an oxidation resistant surface, the method comprising: providing a ferritic stainless steel comprising aluminum and 16 to 30 wt% Cr; and electrochemically modifying (i.e. cathodic deposition of aluminum sulfate) at least one surface of the ferritic stainless steel.

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Still regarding claim 11, Aries does not specify the presence of at least one rare earth metal greater than 0.02 weight percent. However, Aries teaches (page 496) that the addition of rare earth elements strongly improves the adherence of the protective alumina scale on the stainless steel. Since the addition of rare earth elements would be a result effective variable as taught by Aries, it would have been obvious to one of ordinary skill in the art to modify the steel of Aries by adding the desired amount of rare earth elements in order to improve the adherence of the protective alumina scale on the stainless steel as a routine optimization as taught by Aries.

Claims 11-13, 15-22 and 25-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ishibashi (US 4,097,311).

Regarding claims 11-12, Ishibashi teaches (col. 3 lines 28- col. 4 line 22) a method for making a ferritic stainless steel comprising: providing a ferritic stainless steel comprising:

0.001 - 0.15 wt % of C, 0.005 - 3.00 wt % of Si, 0.005 - 10.00 wt % of Mn, 11.00 - 30.00 wt % of Cr and 0.001 - 5.00 wt % of at least one of element(s) selected from the group of N, Cu, Al, V, Y, Ti, Nb, Ta, U, Th, W, Zr and Hf, optionally, 0.75 - 5.00 wt % of Mo and the balance being of Fe, Me/C + N ratio being more than 5.0, while said ratio being more than 8.0 in the stainless steel comprising Nb, Ta, or Ti as the additional element. Said metal compositions corresponding to those of the stainless steel commonly put on the market, for example, 0.005 - 0.03 wt % of C, 0.005 - 0.75 wt % of Si, 0.005 - 1.00 wt % of Mn, 16.00 - 18.00 wt % of Cr, 0.1 - 1.0 wt % of Ti, and the balance being Fe; 0.005 - 0.03 wt % of C, 0.005 - 0.75 wt % of Si, 0.005 - 1.00 wt % of Mn, 16.00 - 18.00 wt % Cr, 0.1 - 1.0 wt % of Ti, 0.75 - 1.25 wt % of Mo and the balance being Fe.

Still regarding claims 11-12 and 15-22, the Examiner notes that the disclosed composition overlaps with the composition of the claimed invention, which is prima facie evidence of obviousness. See MPEP 2144.05 I. It would have been obvious to one of

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ordinary skill in the art to select the desired amounts of Al, Cr and Y from the ranges of Ishibashi because Ishibashi teaches the same utility throughout the disclosed range.

Still regarding claims 11-12 and 15-22, Ishibashi further teaches (col. 7 lines 34-57) electropolishing at least one surface of the ferritic stainless steel.

Regarding claim 13, the Examiner asserts that the steel would inherently develop an aluminum-rich oxide scale comprising iron and chromium and having a hematite structure with the claimed crystal lattice parameters when heated in an oxidizing atmosphere for at least 100 hours at 750 to 850 degrees C because Ishibashi teaches substantially the same composition and substantially the same processing. See MPEP 2112.01 I.

Regarding claim 25, the Examiner asserts that the electropolishing of Ishibashi would inherently require an electropolishing solution and a cathode, and passing a current between the article and the cathode so that material is removed from the surface, thereby reducing surface roughness of the surface.

Regarding claim 26, the Examiner asserts that the electropolishing would inherently improve resistance of the surface to oxidation when subjected to a temperature and an atmosphere characteristic of operating conditions with a solid oxide fuel cell because Ishibashi teaches substantially the same composition and substantially the same processing as that of the claimed invention. See MPEP 2112.01 I. The Examiner notes that the claim does not actually require the step of subjecting to a temperature to occur.

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Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Horita (Stability of Fe-Cr alloy interconnects under CH₄-H₂) atmosphere for SOFCs), published on May 2003.

Regarding claim 10, Horita teaches (sections 1, 2.1 3.2, table 1) a method for making a ferritic stainless steel article having at least one oxidation resistant surface, the method comprising: providing a ferritic stainless steel comprising aluminum, 0.04 wt% cerium and 21.97 wt% chromium; and modifying at least one surface of the ferritic stainless steel so that the modified surface develops an aluminum-rich (section 3.2) oxide scale when heated in an oxidizing atmosphere at 1073 K for up to 792 hours, the oxide scale comprising iron and chromium (section 3.1) and having a Cr₂O₃ structure (which structure would inherently have a hematite structure and have the claimed lattice parameter values).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael P. Alexander whose telephone number is 571-272-8558. The examiner can normally be reached on M-F 10:00 - 6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy V. King can be reached on 571-272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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